WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
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Washington, D. C. No. 8 April, 1937

Classification: Mountain quail

Van Rossem, A. J. A review of the races of the mountain quail, The Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif., 50 cents a copy), 39(1), Jan.-Feb. 1937, pp. 20-24, fig. 7 (map).

Divides the living race into 4 subspecies (one described as new); three of them inhabit the Pacific States and the other, Lower California.

Classification: Najas (pondweeds)

Clausen, R. T. Studies in the genus Najas in the northern United States, Rhodora (Museum of Comparative Zoology, Cambridge, Mass., 20 cents a copy), 38(454), Oct. 1936, pp. 333-345, pl. 437, 4 maps.

Key to 5 species; discussion of characters and distribution of the forms, one N. minor first reported from America. These plants sometimes have considerable value as food for wild fowl.

Conservation: Education

Leopold, Aldo, Chairman. The University and conservation of Wisconsin wildlife, Univ. Wis. Bul. (University of Wisconsin, Madison, Wis.) No. 2211, Science Inquiry Publ. III, Feb. 1937, 39 pp., illus.

A well organized and concise committee report on the decline of wildlife and natural vegetation of the State; reaction of the public to abuse of natural resources; and the opportunity presented for research and education. A program of education is recommended for adoption by the State University.

Conservation: Flood control in relation to

Gabrielson, Ira N. Floods and wildlife, Scientific American (24 West 40th St., New York, N. Y., 35 cents a copy), Feb. 1937, pp. 100-102, 6 photos.

Floods are destructive to wildlife as well as to human beings, and flood control helps both. Small dams on headwaters are effective for flood control and also benefit wildlife. Large dams such as those being built in the upper Mississippi impound pools that greatly increase food and other utilities for waterfowl. Similar impoundments on Federal migratory bird refuges also serve the dual purpose of flood control and improvement of the environment for wildlife.

Conservation: Oregon's wildlife resources

Bean, Ormond R, Chairman. Oregon's wildlife resources, State Planning Board (Portland, Oreg.), 126 pp., 4 pls., 9 maps, 5 graphs, 20 tables, 1936. Mimeographed and multigraphed.

Report of an Advisory Committee on Wildlife, W. L. Finley, Chairman, together with recommendations by the State Planning Board. Chapter headings are Importance of the wildlife resource, Management problems of wildlife, Fur bearing animals, Predatory animals, Migratory waterfowl, Upland game birds, Fisheries resources, The pilchard industry, Shellfish, Conservation, Financial support of wildlife, and Wildlife research. A wildlife management plan is incorporated and explained. Statistical information includes report of fish and game taken during 1933 and 1934, and of elk killed in 1934 and 1935; report of fur taken by licensed trappers for the years 1925 to 1932 inclusive, and for 1935; estimate of the number of fur animals on National Forests; game animals killed by hunters and predators on National Forests; predatory animals killed in or near National Forests; waterfowl counts for 1935 and 1936; and upland game birds released from 1925 to 1934, inclusive.

Control: Bounties

Gerstell, Richard. The Pennsylvania system, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(9), Dec. 1936, pp. 3-5, 16, 2 photos, 1 graph; 7(10), Jan. 1937, pp. 8-10, 15, 24, 1 photo, 1 graph; 7(11), Feb. 1937, pp. 2-3, 24, 2 photos, 1 graph.

History of bounty payments dating from 1683; underlying acts twice were repealed on account of fraud; present statute authorized payment from hunting license funds and puts responsibility for administration entirely upon the Game Commission. Method of operating the present system under which bounties can be paid only to holders of hunting licenses. The amount disbursed for bounties in a twenty-year period (1915-1935) was $1,879,100, of which $1,209,500 was for weasels alone. The administrative cost for this period was approximately $180,000. The general trend of the annual cost of the system has been upward, as has the total number of claims and the numbers presented of all animals upon which bounties are still being paid, except the wildcat.

The second installment of the article discusses in some detail bounty payments by species and their effects and concludes that except in the case of the wildcat upon which the bounty has always been highest (at present $15), bounty payment has proved inefficient as a control measure. Bounty payments largely go to persons taking fur in months when it is prime. There is not sufficient correlation of data to show whether the bounty system has been of value as a game protective measure.

The third installment discusses educational features of the bounty system, in bringing citizens in contact with the Game Commission, informing them as to the necessity of predator control, and teaching them to distinguish the goshawk from other hawks; and in providing an abundance of data useful in connection with different researches. The final recommendations are that bounty payments on goshawks and wildcats be immediately discontinued, that bounties on foxes and weasels be reduced or possibly discontinued, and that the Board of Game Commissioners be given full control of the bounty system in every detail. An editorial note at the end states that the material printed in the Game News represents a part of the findings incorporated in an illustrated bulletin shortly to be issued by the Commission.

Control: Eagles

Dale, Frederick H. Eagle "control" in northern California, The Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif., 50 cents a copy), 38(5), Sept.-Oct. 1936, pp. 208-210.

Reason advanced, killing of lambs; method, shooting from airplanes; result, 200 eagles killed in the neighborhood of Red Bluff in one winter and spring. Benefits to the stockman from the consumption of range pests by eagles are cited. Author's conclusion: "Golden Eagles are highly beneficial to agriculture in the sum-total of their activities and should not be destroyed as a species, although occasional individuals may require destruction because of lamb-killing habits. Control should be limited to the areas where these birds are known to be killing lambs. Bald Eagles have not been found guilty as yet of killing lambs and their slaughter represents a poor investment by the sheep-owner."

Control: Field mice

Silver, James. Orchard mouse control, The Mountaineer Grower (Martinsburg, W. Va.), 7(78), Oct. 1936, pp. 3-6.

Field mice populations fluctuate and are apparently approaching a peak in the Shenandoah Valley. Damage is serious and control methods not entirely satisfactory. Mice develop a certain resistance to strychnine and baits, to be effective, must be distributed with due regard to time and place. A formula using steam-crushed whole oats is recommended and directions given for its use. An apple bait also is described.

Control: Fish predators

James, M. C. Stocking interior waters of the United States, U. S. Bureau of Fisheries, Fishery Circ. (Supt. of Documents, Washington, D. C., 5 cents a copy) 8 (rev.), 18 pp., 7 figs., Sept. 1936.

Predators are discussed on pages 15-16 but only destructive methods of control are considered. This is contrary to wildlife management on sound biological lines. Preventive measures not involving the death of predators are known and should be used. Those relating to birds are described in U. S. Dept. Agr. Leaflet 120, Excluding Birds from Reservoirs and Fishponds, 1936.

Control: Vermin

Trombley, F. T. Just what is vermin, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(10), Jan. 1937, pp. 4-5, 23, 4 photos, 2 drawings.

"Vermin" has been defined as "any animal that preys upon other animals of greater worth to man." The difficulty is in truly appraising worth and it is becoming evident that the net results of "vermin" persecution are almost the exact opposite of those it is intended to accomplish. Complex and little understood inter-relations of wildlife indicate the need of discretion in killing. The author prefers the definition of "vermin" as an animal out of place, just as a plant out of place is regarded as a weed.

Control: Vermin, the effects of

Morrison, Kenneth D. Rats, grasshoppers, and man, Minnesota Conservationist (Dept. of Conservation, St. Paul, Minn., 15 cents a copy), 42, Feb. 1937, pp. 18-20, 3 photos.

Comment on occupation of the land and drainage in relation to wildlife, but especially on vermin control. "If we continue devastating nature and applying countless panaceas according to the whims of every loud-mouthed exponent of 'Kill this' and 'Kill that' slogans that masquerade under the guise of conservation, we will soon have a natural fauna that will consist of little more than Rats, Grasshoppers, and Man."

Control: Vermin problem

Lay, George B. The importance of rodent control in game management, Georgia Sportsman (State Dept. of Game and Fish, Atlanta, Ga., 10 cents a copy, 1(1), Nov. 1936.

Rodents compete with quail for food and ordinarily their natural enemies should not be interfered with. Exceptions concern Cooper's and Sharp-shinned hawks generally, other species occasionally and individually, and areas where game is being propagated for stocking purposes or for sale. Pole traps should not be used. Feral cats and dogs should be eliminated.

Control: Vertebrates in insect control

Sweetman, Harvey L. The biological control of insects (Comstock Publishing Co., Ithaca, N. Y., $3.75 a copy), 461 pp., 142 figs., tables.

Chapter XII, pp. 318-339, figs. 130-134, entitled "The use of predatory vertebrate animals", contains information on the food habits of animals of the various phyla, and examples of the actual utilization in practical control of fishes in relation to mosquitoes, and of the giant toad as a consumer of sugar cane insects.

Control: Wolf bounties

Cross, E. C. Wolf! Wolf!, Rod and Gun in Canada (1224 St. Catherine St., West, Montreal, Canada, 10 cents a copy), 38(8), Jan. 1937, pp. 18-19, 32-33, 4 figs.

Both timber and brush wolves (coyotes) are common in Ontario. The latter have increased rapidly in recent times and exhibit distinct 10-11 year fluctuations in numbers. During the last ten years some 33,000 wolves were destroyed at a cost for bounties of half a million dollars. There is no evidence of any reduction in the timber wolf population and the brush wolves have increased. The total wolf population is actually greater at the present time than it was ten years ago despite the amount spent in wolf destruction. The effect has been to kill off a surplus thus making things easier for the survivors. Had no bounties been paid during the last twenty years, probably there would have been no material difference in the wolf population today. "The premise on which bounty payments and campaigns for predator control have been based, is that if there were fewer predators there would be more game." However, deer greatly increased both in number and in range in Ontario at the same time that the wolves were increasing. The author comments that "numbers are controlled by a complex of factors, of which the predator is but one and by no means the most important." "If the money spent in 'wolf control' were to be used in finding out what our natural resources in fur and game need, and meeting that need, it would return dividends instead of deficits."

Cycles

Davis, David E. A cycle in northern shrike emigrations, The Auk (3200 22nd St. N., Arlington, Va., $1.00 a copy), 54(1), Jan. 1937, pp. 43-49.

Data chiefly from Christmas censuses in Bird-Lore indicate that the northern shrike emigrates periodically, the periods averaging 4.2 years. Discussion of cyclic occurrence of other birds and of mammals. Bibliography of 15 titles.

Cycles: Snowshoe hare

Green, R. G. Present status of the snowshoe hare cycle investigation (Dr. R. G. Green, University of Minnesota, Minneapolis, Minn.), 3 pp., Jan. 1937, mimeographed.

Apparently shock disease is the actual killing mechanism which causes the die-off. Its prevalence and symptoms are discussed; abundance of ticks seems to be an essential associated condition. Plans for an experiment to yield more definite information.

Destruction

Snyder, L. L. Vanished and vanishing birds, Hunting and Fishing in Canada (428 University Tower, Montreal, Canada, 15 cents a copy), 3(1), Jan. 1937, pp. 8-9, 18, 23, 4 drawings by T. M. Shortt.

Brief accounts of extinct species: Great auk, Labrador duck, Carolina paroquet, passenger pigeon. To be continued.

Destruction: Game birds by severe winter

Green, William E., and Watson E. Beed. Iowa quail and pheasants in winter, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(6), Nov.-Dec. 1936, pp. 83-84, 90-92, 4 photos.

February 1936 was the coldest of 117 Februaries on record for Iowa and there was heavy snow and strong, cold winds; 187 pheasants found dead were examined, and they were well fed. "It was evident that death was not due either to lack of food or to lack of cover alone, but that mortality was directly proportional to the distance of food from good protective cover." There was a mortality of 250 or 62.5 percent of 400 birds on an observation area. 131 (32.75 percent) either froze or choked to death; 37 (9.25 percent) were found snowed under; 13 (3.25 percent) showed evidences of pneumonia; 12 (3 percent) were illegally shot; one bird was starved and one killed by a predator, probably a hawk. The sex ratio of survivors was about three hens to one cock. The effect of the severe conditions upon quail differed, apparently as a result of greater deprivation of cover. Losses to predators, chiefly Cooper's hawk, amounted to 14.5 percent; and to cold and hunger, chiefly the former, 40.5 percent.

Destruction: Quail by severe winter

Scott, Thos. G. Snow-killing of the bob-white, Wilson Bulletin (Dr. T. C. Stephens, Morningside College, Sioux City, Iowa, 60 cents a copy), 49(1), March 1937, pp. 21-27, figs. 2-4, 1 table.

The severe weather of the late winter of 1936 in Iowa (see also preceding abstract) resulted in death by snow imprisonment of quail, an instance of which is described and illustrated. Conclusions are: that reasonably healthy bobwhites may perish through exposure to strong cold winds and snow, as well as by imprisonment; that cover, subject to drifting, is not ideal; and that research into management practices should include study of the effect and control of drifting snow.

Disease: Bighorn sheep

Potts, Merlin K. Hemorrhagic septicemia in the bighorn of Rocky Mountain National Park, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 105-106.

Identified from a single sheep that was found dead; discussion of import of the disease to the species.

Disease: Eelgrass

Renn, Charles E. Persistence of the eel-grass disease and parasite on the American Atlantic Coast, Nature (Macmillan & Co., Ltd., St. Martin's St., London, W. C. 2, England, 1 shilling a copy), 138(3490), Sept. 19, 1936, pp. 507-508.

Despite promising spring growth in some areas, the parasite flourishes and the wasting disease persists. The author's conclusion is: "If previous experience may be taken as an indication, the following seasonal sequence may be expected: Very slow winter growth of the Zostera with the Labyrinthula passive in the leaves (the spindle form of the parasite has been found in winter specimens), rapid vegetative development in the late spring, with slight increase in activity of the Labyrinthula, diminution in the vitality of the plant prior to seed formation in the early summer with sudden activation of the parasite, destruction of leaves, development of new leaf shoots and their subsequent destruction (repeated several times in mid-summer), and final exhaustion of a portion of the stem stock and dying back of part of the bed developed earlier. A number of plants will seed prematurely, or will appear to because more retarded members die off before the normal fruiting period is finished. Barring the development of resistent strains of Zostera or general attenuation of the parasite, this seems to be the probable cycle within any progressive return of the plant. This, I realize, is not a cheerful interpretation, but it will be recognized that readjustments no less drastic, but easily overlooked, occur constantly."

Disease: Rabbit papillomatosis

Larson, C. L., J. E. Shillinger, and R. G. Green. Transmission of rabbit papillomatosis by the rabbit tick, Haemaphysalis leporis-palustris, Proc. Soc. Exp. Biol. Med. (Griffiths Press, 100 Liberty St., Utica, N. Y., 75 cents a copy), 33(4), Jan. 1936, pp. 536-538.

The disease is accompanied by the so-called rabbit horns. It is caused by a filtrable virus which was experimentally proved to be mechanically transmissible by the rabbit tick. The authors suggest that the infection may likewise be transferred by mosquitoes and other biting flies.

Disease: Roup

Quortrup, E. R. Roup, its causes and treatment, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(10), Oct. 1936, pp. 213, 220-221.

Symptoms; occurs chiefly in immature and is associated with exposure and sudden changes in temperature; preventive measures; treatment.

Disease: Salmonella in quail

Edwards, Philip R. The occurrence of Salmonella, Oranienburg type, in an infection of quail, Journ. Bacteriology (Williams and Wilkins Co., Baltimore, Md.), 32(3), Sept. 1936, pp. 259-263, 1 table.

The identification of this organism from quail chicks in Kentucky constitutes the first report of the presence of this bacillus in America and also the first record of the appearance of this type of bacterium in diseases of animals.

Ecology

Saunders, Aretas A. Ecology of the birds of Quaker Run Valley, Allegany State Park, New York, New York State Museum Handbook (Albany, N. Y.), 16, 174 pp. (5 x 7-1/2), 68 figs. (photos, maps), tables, 1936 (1937).

General discussion of ecological principles as related to this report. List of 141 species of breeding birds. Method of estimating the population was counting of singing males in strips bisected by a paced line, each 175 double paces of which traversed an area of 10 acres. The birds are discussed by habitats, and the information summarized in a table. The most numerous species were, black-throated green warbler, red-eyed vireo, and ovenbird. The habitat having the largest number of pairs of birds was the young maple-beech-hemlock association. The number of pairs per 100 acres was greatest (182.1) in mature maple-beech-hemlock growth. The average number of pairs per 100 acres for the whole area (nearly 17,000 acres) was 84.6.

The effects of succession on the bird population are discussed and one of the conclusions appears different from that usually drawn by naturalists. That is, "as the forest grows the numbers of breeding birds will increase in proportion to the height of the forest crown." The conflict is only apparent, however, as closure of the crown is stated to be accompanied by disappearance of ground vegetation and of certain species of birds. As the forest matures, more light reaches the ground, undergrowth returns, and the variety of birds increases. The period of dearth naturally is shorter in deciduous and mixed woodland than it is in pure coniferous stands. Thirty pages are devoted to an account of the ecology of the ruby-throated hummingbird.

Ecology: Animals in relation to soil and water

Holt, Ernest G. Wildlife in soil and water conservation, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(6), Nov.-Dec. 1936, p. 86, 2 photos.

Animals play a tremendous part in the conservation of soil and water resources and their function and rights must be considered in allocations of these basic resources.

Ecology: Animal populations of grasslands

Wolcott, George N. An animal census of two pastures and a meadow in northern New York, Ecological Monographs (Duke University Press, Durham, N. C., $1.50 a copy), 7(1), Jan. 1937, pp. 1-90, 45 tables.

Relates mostly to invertebrates. "it was found that where there were few cows in the pasture, they scarcely equalled in weight the total of the wild life present there, and the insects ate more of the grasses and clovers than the cows did." Percentage by bulk of food items of robins in Illinois

bore a roughly proportional relationship to percentages by their weights in the New York pastures. The robin preys very effectively upon some groups and where numerous reduces the population of these insects below those of less preferred areas.

Ecology: Carrying capacity, ruffed grouse

Errington, Paul L. Winter carrying capacity of marginal ruffed grouse environment in north-central United States, Canadian Field Naturalist (582 Mariposa Ave., Rockcliffe Park, Ottawa, Canada, 25 cents a copy), 51(3), March 1937, pp. 31-34, 1 table.

In territory marginal for the species carrying capacity appears to be rather definite and the author's previous findings for bobwhite that populations within carrying capacity are secure, those exceeding it, insecure, are paralleled. They are not given general application because of apparently conflicting results of other investigators.

Ecology: Clean-up work

Murie, Olaus J. Down logs, Atlantic Monthly (10 Ferry St., Concord, N. H., 40 cents a copy), 158(5), Nov. 1936, pp. 596-599.

An effective protest in literary form against the spoiling of wildlife environment and desecration of wilderness areas.

Ecology: Deer in Ontario

Cross, Ewart C. The white-tailed deer of Ontario, Rod and Gun in Canada (1224 St. Catherine St., West, Montreal, Canada, 10 cents a copy), 38(9), Feb. 1937, pp. 14-15, 32, 2 maps.

Settling of the country forced deer out of fertile range onto lands submarginal for the animals as well as for agriculture. These areas have one advantage in that the thinner populations they support do not offer good opportunity for diseases. Limiting effect of availability of winter browse. Relations of wolves and wolf bounties more fully discussed in another article. (See page 5.) Need of full information and skilled wildlife management to make the best of the situation.

Ecology: Niobrara Game Preserve

Reed, Watson E. A preliminary study of the animal ecology of the Niobrara Game Preserve, Conservation Dept. (Univ. of Nebraska, Lincoln), 10, 33 pp., 3 figs., tables, Oct. 1936.

Description of the area, its meteorology, vegetation, and animals. The terrestrial vertebrates are discussed by classes, and lists of them presented for the various ecological associations.

Ecology: Photoperiodism

Bissonnette, Thomas H. Sexual photoperiodicity, Quarterly Review of Biology (Williams & Wilkins Co., Baltimore, Md., $1.50 a copy), 11(4), Dec. 1936, pp. 372-386.

Review of the subject for both plants and animals; discussion of experiments; present state of knowledge. Notes on animals wild in this country pertain to crow, junco, starling, and 13-lined ground squirrel. 127 references to literature.

Ecology: Populations

Bureau of Animal Populations (Oxford University, England), Annual Report 1935-36, 48 pp., 1937.

History of the Bureau (Charles Elton, Director); statement of its support; summary of researches on populations of voles, rabbits, hares, partridges and grouse; report on North American enquiries particularly as to cyclic fluctuations of the snowshoe hare and other northern species; on special surveys; and on animals introduced into Great Britain, including the North American muskrat and gray squirrel. There is a list of publications by members of the staff in 1935-36 and a bibliography of 102 titles of recent literature on animal populations.

Ecology: Populations, European partridge

Middleton, A. D. The population of partridges (Perdix perdix) in Great Britain during 1935, Journ. Animal Ecol. (Cambridge University Press, Fetter Lane, London, E. C. 4, England), 5(2), Nov. 1936, pp. 252-261, 4 figs., 6 tables.

Author's summary: "In 1935 the partridge population of most parts of Great Britain showed a further increase. The nesting stock was greater than in 1934, in some areas, e.g. Norfolk, apparently approaching a maximum. A third favourable summer for survival of young, similar to those of 1933 and 1934, resulted in a high autumn density, the numbers killed in 1935 being 9% greater than in 1934 and 64% greater than in 1933."

Ecology: Populations, house wren

Kendeigh, S. Charles, and S. Prentiss Baldwin. Factors affecting yearly abundance of passerine birds, Ecological Monographs (Duke University Press, Durham, N. C., $1.50 a copy), 7(1), Jan. 1937, pp. 91-123, 8 tables.

Another contribution from 14 years study of the house wren. On an area of approximately 15 acres the following yearly averages were obtained: number of adults, 19.7; sex ratio 109.6 males:100 females; number of broods during first and second breeding periods, 7.8, 6.0; broods per female, 1.5; percentage increase in number of birds during breeding season, 284; and

percentage annual mortality, 72.8. The factors affecting yearly mortality are largely meteorologic. There is a considerable non-breeding population composed principally of immature birds. Adults seem to return to same localities to nest; in the immature there is a tendency to dispersal.

Ecology: Sampling insect populations

Carpenter, J. Richard. Quantitative community studies of land animals, Journ. Animal Ecology (Cambridge University Press, Fetter Lane, E. C. 4, London, England), 5(2), Nov. 1936, pp. 231-245, 1 fig., 2 tables.

Bearing principally on the sweep net method (previously referred to in WILDLIFE REVIEW, No. 1, Sept. 1935, p. 32, and No. 7, Dec. 1936, p. 14) which is approved as being sufficiently accurate, this contribution embraces discussion and a bibliography (58 titles) of considerably wider scope. The remarks upon daily, seasonal, and annual fluctuations in the numbers of animals active in communities are of interest.

Ecology: Stand improvement

Barret, Leonard I., W. C. Branch, and P. F. W. Prater, Committee. Current stand improvement practices and policies in the southern Appalachian region, Journ. Forestry (Mills Bldg., Washington, D. C., 65 cents a copy), 34(8), Aug. 1936, pp. 771-774.

Relates essentially to work done by the C.C.C. Silvicultural methods are tempered by a variety of public interests, among which the Committee reports a satisfactory compromise has, in general, been reached. Some of the criticism in the past has been justified, including that relating to game food values being reduced beyond reasonable necessity. The Committee classifies the principal plants concerned into four groups, one of which Special-Use and Game-Food Species includes: dogwood, holly, black gum, chinquapin, umbrella magnolia, fire cherry, Crataegus, persimmon, and sumac. With special reference to these shrubs and trees, the Committee reports: "Our figures indicate that next to the species of highest timber value the special-use and game-food group are removed to a lesser extent than are the remaining two species groups." To the wildlife specialist this is not a very satisfactory finding, however, as among the plants excluded from this list, and according to the report more frequently eliminated in stand improvement work, are 5 species of oaks, all hickories, red maple, 2 species of pine, black birch, butternut, beech, blue beech, ironwood, sassafras, and balsam, all of which are of equal value to wildlife with species included in the special-use list. The findings therefore depend upon the definitions of the groups, and if a wildlife proponent had made them, the results of the investigation could not have been couched in such palliatory terms.

Economics: House rat

Silver, James. The house rat, U. S. Dept. Agr. Circ. (Supt. of Documents, Washington, D. C., 5 cents a copy), 423, 18 pp., 15 figs., Jan. 1937 (March).

General account of the brown rat in the United States with special reference to its destructiveness. Discussion of its introduction and spread, habits, abundance, economic status, and relation to public health.

Economics: Value of Alaskan wildlife

Troy, John W. Annual Report of the Governor of Alaska (Supt. of Documents, Washington, D. C., 10 cents a copy), 1936, 44 pp.

"The value of Alaska's resources of game and fur is conservatively estimated on a meat and pelt value of more than $93,000,000. The yearly monetary returns to the residents of the Territory are in excess of $4,000,000. The value of furs shipped from Alaska during 1935 was $1,416,037.65."

Education: Wildlife management in North Dakota

Fox, Adrian C. What can be done to improve the environment for wildlife?, Soil Conservation Service (North Dakota Project No. 1, Park River, N. D.), 20 pp., 1937, mimeographed.

Consists chiefly of 118 questions and answers for use in a night school established by the Soil Conservation Service and North Dakota Extension Service, cooperating. Sample subjects receiving most attention are cover, erosion control, feed patches, feeding stations, predators, refuges, and work of the Soil Conservation Service.

Food Habits: Deer browse

Howard, William J. Notes on winter foods of Michigan deer, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 77-80.

Observations in Emmet County during the winter of 1934-1935 indicate the most important browse plants to be: white cedar, common juniper, red-osier dogwood, aspen, withe-rod, and sumac. Notes are given on less utilized species also, and the browse situation is described as becoming critical.

Food Habits: Fish-eating birds

Langlois, T. H. A study of the small-mouth bass Micropterus dolomieu (Lacepede) in rearing ponds in Ohio, Ohio Biol. Survey Bul. (Division of Conservation, Columbus, Ohio), 4(4), [33], pp. 191-225, 13 figs., 5 tables, Oct. 1936.

Brief statement of stomach contents of 14 kingfishers, 4 great blue herons, and 20 little green herons, shot at one State fish farm in July 1933. The propagated fishes, bass, were found in only one of the 14 stomachs of the kingfishers examined and in 9 of the 20 green herons. Tabulation of birds killed at twelve fish farms in 1932 (513 of 10 species), and in 1934 (445 of 8 species). In both years the preponderant species were kingfishers and little

green herons. Comment: A method of protecting the fish other than killing the birds would seem desirable and more in harmony with general conservation ideals.

Food Habits: Fur seal

May, Franklin H. The food of the fur seal, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 99-100, table.

Of 113 stomachs from Washington and Alaskan waters, only 39 contained food, the predominating element of which was herring; traces of squid, crustaceans, and vegetable matter also were present.

Food Habits: Pheasant

Gigstead, Gilbert. Habits of Wisconsin pheasants, Wilson Bulletin (Dr. T. C. Stephens, Morningside College, Sioux City, Iowa, 60 cents a copy), 49(1), March 1937, pp. 28-34.

The hardiness and general adaptability of the pheasant as a sporting bird are commented upon. Agricultural districts containing marshes providing cover are the best pheasant range in Wisconsin. Investigation of damage to corn plantings showed the pheasants involved but not as destructive as ground and tree squirrels and domestic pigeons. However corn is eaten at all seasons and composes about a third of the pheasant's fall and winter diet. A farm population of 25 pheasants will consume in a winter some 240 pounds of corn worth about $3.60. With sale of hunting privileges, permitting the shooting of one-third of the 25 birds would net the farmer at least twice the price of the 240 pounds of corn. The best plants for feed patches are yellow kaffir corn and wheatland milo maize. Information is given in text and table on analysis of the contents of 141 crops collected in August, October, November, December, and January. Corn was a leading item in all months. Important supplements in August were oats and grasshoppers; in October, ragweed, yellow foxtail, and grasshoppers; in November, ragweed; in December, Spanish-needle and poison sumac; and in January, poison sumac.

Food Habits: Rabbit damage

Wood, O. M. Early survival of some pine interplantings in southern New Jersey, Journ. Forestry (Mills Bldg., Washington, D. C., 65 cents a copy), 34(9), Sept. 1936, pp. 873-878, 1 fig., 2 tables.

Most of the damage occurred the first winter after planting and it resulted in total loss of 20 or more percent, and damage to an additional proportion of certain species of pine seedlings. For all species and plantings together, 8 percent were killed, and an additional 8 percent injured.

Food Habits: Red fox

Errington, Paul L. Food habits of Iowa red foxes during a drought summer, Ecology (Prince and Lemon Sts., Lancaster, Pa., $1.25 a copy), 18(1), Jan. 1937, pp. 53-61, 3 tables.

Author's summary: "Comparisons were made of the food habits of red foxes in Iowa during the drought season of 1934 and the 'normal' season of 1933. The data were obtained from the examination of 1,010 food items and 1,175 fecal samples from 113 breeding dens in 1933 and 2,848 food items and 935 fecal samples from 200 dens in 1934.

"From this material, the conclusions may be drawn that, of the chief types of food, the representation of rabbits, ground squirrels, passerine birds, and ring-necked pheasants was nearly the same in 1934 as in 1933; that the representation of mice dropped appreciably in 1934, coincident with a rise in representation of pocket gophers, domestic chickens, and insects (mainly such Coleoptera as Phyllophaga).

"The increase in representation of insects in fox diet was especially pronounced.

"On the basis of contemporaneous data from population studies of certain prey species and studies of the food habits of predators other than foxes, it would appear that the adverse effects of the drought upon the general habitat of prey species was followed by increased vulnerability of most of the latter, only some were rendered more vulnerable than others, and were accordingly preyed upon the more."

Food Habits: Red fox

Errington, Paul L. Food habits of the red fox in Iowa, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 26(1), Jan.-Feb. 1937, pp. 5-6, 13, 1 photo.

Report on field work, and on analyses of stomach contents, feces, and material collected at dens. Mice and rabbits are staple foods, but a great variety of other creatures are taken, usually in proportion to their availability. Many of these articles of diet are listed and a general discussion of predation is included.

Food Habits: Red fox

Murie, Adolph. Following fox trails, Univ. of Michigan Misc. Publ. (Univ. Mich. Press, Ann Arbor, Mich.), 32, 45 pp., 6 pls., 7 figs., 1 table, Aug. 1936.

A study of the food habits of foxes in Michigan by trailing when snow was present and by analysis of droppings. The leading food item was cottontail rabbits; next were lemming-voles (Synaptomys), meadow-mice, and insects.

Availability largely controls choice of food. The habit of storing surplus catches was marked; the caches are robbed by the skunk, crow, and marsh hawk. Shrews and moles are not relished for food but nevertheless are killed when opportunity occurs. Heavy fox depredations do not prevent the rabbit population from flourishing. Like most wild creatures, the fox does both good and harm so far as the economic interests of man are concerned. From the purely economic point of view, it would seem best to permit the fox to exist in fair numbers, controlled primarily by hunting and trapping. "If our out-of-doors is to be managed on broad lines so that the various interests both economic and aesthetic are considered, and not for the special benefit of small minority groups, then the fox should be permitted to occupy its rightful niche in the woods and fields."

Food Habits: Rodent browse

Siegler, Hilbert R. Winter rodent damage to game cover, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 57-61, 2 tables.

Upon the basis of observations in Jefferson County, Wisconsin, during the severe winter of 1935-1936, it is concluded, that mice did more damage than rabbits but that the latter attacked a greater variety of plants; that cut brush serves to protect standing growths; and that there are differences in palatability within food species probably due to chemical composition. A complete list is given of plants found damaged. The favorites of the rabbit are: smooth sumac, blackberry, raspberry, oak, wild black cherry, and rose; of the mice, wild black cherry, wild plum, gooseberry, oak, blackberry, and apple. Among plants little used and therefore preferable for food plantings are: red cedar, creeping juniper, poplars, elder, hazel, dogwoods, swamp birch, Virginia creeper, frost grape, and honeysuckles. Bibliography of 6 titles.

Food Habits: Trees and shrubs producing food for wildlife

Viehmeyer, Glenn. Trees and shrubs of value as a source of food for birds in the Sandhill Region of Nebraska, The Nebraska Bird Review (1410 North 37th St., Lincoln, Nebr., 25 cents a copy), 5(1), Jan. 1937, pp. 3-5.

Comment based largely on the writer's observations on the following 18 species of trees and shrubs: eastern red cedar, hackberry, Russian mulberry, wild gooseberry, wild black currant, wild golden currant, prairie rose, prickly rose, wild plum, western choke cherry, smooth sumac, ill-scented sumac, western snowberry, bittersweet, wild grape, Virginia creeper, Russian olive, and green ash. Notes on value for cover also are included.

Introduction: Red grouse

Ward, J. D. U. Red grouse as pets and colonists, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(12), Dec. 1936, p. 259.

Hand-reared stock accustomed to special food was used to colonize the species in New Zealand. Speculation as to the chance of similar success in the United States.

Life Histories: Beaver

Soper, J. Dewey. Notes on the beavers of Wood Buffalo Park, Alberta, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 1-13, 2 pls., 2 figs.

Aspen is the principal food tree; next in order of choice, or availability, are white birch, balsam poplar, willows, and alders, and rarely conifers, as white spruce. Notes on dams and lodges, and on value in stabilizing water levels. Trapping methods described and illustrated. Beaver have increased under protection so that there are about 15,000 present; total carrying capacity of the area from 75,000 to 100,000.

Life Histories: Chukar partridge

Rolph, James, III. Who is he - this Mr. Chukor, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), Part I, 40(10), Oct. 1936, pp. 207, 222-223, 1 photo; Part II, 40(12), Dec. 1936, pp. 249-261.

Compiled information relative to color and other characters, geographical distribution, introduction into the United States, cover requirements, social organization, food, breeding and nesting habits, eggs, sporting qualities, and enemies in Part I. In Part II is discussion of the chukar on the game farm, with reference to sanitation, mating, and care of breeders and eggs.

Life Histories: Roosevelt elk

Orr, Robert T. Notes on the life history of the Roosevelt elk in California, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 62-66.

The present restricted range is principally forest land; important food plants are sword fern, deer fern, bilberry, huckleberry, salal, salmon berry, wild lilac, willows, and grasses; some damage is done to corn and barley; notes are given on trails and beds; the animals are not numerous and are in need of additional protection to save them from extermination in the State.

Life Histories: Sage grouse

Girard, George L. Old Tom, the sage cock, issues a challenge to action, Outdoor America (1167 Merchandise Mart, Chicago, Ill., 10 cents a copy), N. S. 1(11), Sept. 1936, pp. 4-5, 9, 5 photos.

Excerpts from thesis based on the author's well known research on this bird, relative to nesting habits, flying and walking speeds, enemies, grazing competition, and food, together with suggestions for establishment of refuges, restriction of shooting privileges, and education as to the needs of sage grouse and ways of meeting them.

Life Histories: Snowshoe hare

Aldous, C. M. Notes on the life history of the snowshoe hare, Journ. Mammalogy (Wm. H. Burt, University of Michigan, Ann Arbor, Mich., $1.00 a copy), 18(1), Feb. 1937, pp. 46-57, 1 pl., 1 fig. (graph), 2 tables.

Principal results from studies in Minnesota, 1932-1935. Notes on longevity (few if any attain 8 years); sex ratio (54 percent males); breeding season (March-August) and rate of breeding (probably 2-3 times per year); size of litter (average 2.4 young); parental care of young (none after weaning); nests and forms; physical characteristics in the breeding season; dusting places; pelage changes; migrations (territory normally limited to a few acres, no definite migration observed); retrap tendencies; and homing instinct. Bibliography of 8 titles.

Life Histories: White-tailed deer

Atwood, Earl L., Jr., and Julian A. Steyermark. The white-tailed deer in Missouri, Clark National Forest (St. Louis, Mo.), 34 pp., 9 figs., 1937, mimeographed.

Observations on the food of deer transported from Minnesota to fenced areas in Missouri. Seasonal food plants listed by species. Nearly half of the State should be deer range but the animals have been hunted out until only a few hundred survive. Out-of-season hunting and illegal killing of does in season are destructive factors, more so than predators, of which dogs are ranked ahead of wolves and wildcats. Notes on habits.

Management: Bobwhite

Stoddard, Herbert L. Fifth Annual Report Cooperative Quail Study Association (Thomasville, Ga.), 1935-36, 23 pp., Oct. 1936.

Among the topics of general interest that are treated are: the use of fire in cover control, cover development, and experimental work with game food plants. Some of the plants commented upon are sesbania, sericea lespedeza, little black cowpea, trailing wild bean, Texas millet, fall grains, and a row-planting feed patch combination. There is a report of progress on the

fire ant work, and sections on "red quail" experiments, planting for doves, wild turkey studies, and investigations of mammals in relation to game and wildlife (this last topic the special care of E. V. Komarek).

Management: Bobwhite cover

Stoddard, Herbert L. Bobwhite quail and their preferred cover, Outdoor Florida (1306 Grand Central Ave., Tampa, Fla., 10 cents a copy), 1(9), Nov. 1936, pp. 11-12, 1 photo.

Value of the bobwhite; leasing of shooting rights for from 5 to 20 cents per acre; environmental improvement superior to, and more economical than, restocking; desirable and undesirable types and qualities of cover, their interspersion and management; controlled burning. "Quail can be produced by simple measures in any desired numbers where sufficient feed and cover is provided and indulgence in quail shooting is in proportion to production."

Management: Cottontail

Anon. How to improve rabbit habitat, Ohio Outdoor News (210 N. Court St., Circleville, Ohio, 5 cents a copy), 2(6), Dec. 1936, p. 2.

Use of old fence wire; rail, rock, and slab piles; brush heaps; tile and nail kegs for cover; clover and rape for food.

Management: Cottontail

Gerstell, Richard. Management of the cottontail rabbit in Pennsylvania, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(12), March 1937, pp. 6-7, 27, 30, 5 photos; 8(1), April 1937, pp. 15-19, 3 photos, 2 graphs.

Part 1. Differences in habits of subspecies and of sexes; the females apparently hole-up far more than the males. The sex ratio of rabbits imported from Kansas and Missouri was approximately even. The importation policy has prevailed since 1915 and animals have been obtained from a number of States, over 90 percent of them, however, from Kansas and Missouri. In twenty years (1916-36) more than 700,000 rabbits were purchased at a cost (including shipping charges) of about one dollar each. Transportation mortality varies from 3 to 7 percent and there are apparently considerable losses shortly after liberation.

Part 2. Despite restocking, "the fall rabbit population varies annually according to certain limiting factors, such as winter losses and breeding season conditions"; "the general population tendency during the past has been toward a generalized reduction in density"; "general rabbit conditions have become gradually worse for a period of approximately fifteen years," and are now acute. Steady reduction in numbers may obscure fluctuations in the rabbit population but "it is important to note that 1918, 1928, and 1936, 'low' years in the grouse cycle in Pennsylvania, were also 'poor' cottontail rabbit seasons."

There is "no direct relationship between the number of cottontails released during a given winter and the number of animals legally shot the following fall" and it may well be said that the result of Pennsylvania's rabbit restocking program has been largely psychological. The spread of clean farming and hunting pressure are the main factors responsible for the decline of the rabbit population. Forest growth on abandoned farms reducing rabbit habitat, killing by automobiles, predation, unskilful and illegal trapping are additional limiting factors. Other articles to follow.

Management: Cottontail

Stuber, James W. Ohio rabbit propagation now in vogue, Ohio Outdoor News (210 N. Court St., Circleville, Ohio, 5 cents a copy), 2(6), Dec. 1936, pp. 6, 8.

Encouragement of rabbit propagation in the wild by establishment of rabbit producing areas in cooperation with farmers and sportsmen's organizations. The average cost was from $10 to $12 per area. Brief account of life history, and full treatment of food and cover of the native cottontail. Planting of sweet corn, rape and other things to improve habitat. Artificial cover facilities are suggested, and enemies and other causes of loss discussed.

Management: Demonstration in Michigan

Anon. The Allegan Project, Michigan Conservationist (State Dept. of Conservation, Lansing, Mich.), 6(6), Nov.-Dec. 1936, pp. 7-8, 3 photos.

A tract of 44,000 acres in Allegan County, Mich., acquired by the Federal Resettlement Administration is being managed for wildlife. Account of the work accomplished and of plans for the future.

Management: Farmer-sportsman relationship

Biddle, Nicholas. Regulated shooting areas, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(10), Jan. 1937, p. 16, 1 photo.

Results of an inspection trip to regulated shooting areas in Connecticut and both public hunting grounds and regulated areas in New Jersey.

Management: Farmer-sportsman relationship

Conklin, W. Gard. Chester County farm game project successful, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(10), Jan. 1937, p. 17, 3 photos.

Report on first season's operation of one of the cooperative farm game projects noticed in WILDLIFE REVIEW, No. 7, December 1936, p. 25. Considered a success.

Management: Farmer-sportsman relationship

Conklin, W. Gard. An analysis of the farm game program, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(12), March 1937, pp. 8-11, 31, 4 photos, 1 map, 1 table.

Statement of the problem and how Pennsylvania is endeavoring to solve it. Description of the farm game refuge project; its operation and success; and finances.

Management: Farmer-sportsman relationship

Hicks, Lawrence E. The controlled hunting areas and the pheasant refuge management system in northwestern Ohio, Ohio Wildlife Research Sta. (Ohio State University, Columbus), Release No. 23, 8 pp., mimeographed.

One of the most constructive contributions to this vexed problem that has yet appeared. Ohio has certainly solved pheasant production as proved by a kill of 620,000 male birds on lands that are devoted 70% to 90% to harvested crops. More than 98% of the pheasant bag is said to be made up of naturally propagated birds. The management system is built around State refuges, but gives attention to cover, especially for nesting, planting of feed patches, leaving standing corn for winter, and control of man, cats, dogs, and crows. Surplus stock is trapped and transplanted where needed.

The dependable pheasant crop has made possible a controlled hunting system, which is organized by townships. A game protective association is founded by groups that attend the same school, church, grange or lodge and thus has social solidarity from the beginning. Hunting is by association members only, but non-residents become members by purchase of permit tags at prices ranging from $2 to $3.50, entitling the holder to hunt over all association lands. No hunting is permitted within 500 feet of any building or in standing corn where work is going on, and there are other restrictions. A number of township associations collect from $500 to $1000 per year. The money is spent for printing and posting, hire of enforcement officers, management measures, and social events, and unexpended balances go into school and church funds or are pro-rated to landowners. The advantages of the system are enumerated as follows: "(a) There is an orderly harvest of the surplus crop each year; (b) Law violations are minimized. Unscrupulous hunters avoid controlled hunting areas; (c) Property interests of landowners are protected - trespassing abuses are eliminated; (d) An adequate brood stock is preserved; (e) A larger pheasant yield is possible each year and a given area provides good hunting for more hunters - not less; (f) Landowners regard larger game crops as an asset, not as a liability; (g) Landowners modify agricultural operations in the direction of pheasant management; (h) From 65% to 95% of the farmer-landowners hunt themselves, so view game production from both the farmers' and sportsmen's viewpoints; (i) Ideal farmer-sportsmen relationships are made possible. Sportsmen value highly their granted privileges and farmers take great pride in the number of birds taken on their farms. Instead of repeated posted lands with 'No Hunting' signs, hunters are pleased to see such

refreshing and psychologically sound signs as 'Welcome members of Blank Township Game Protective Association'; (j) The non-resident hunter (city man) is pleased with the system because he is guaranteed good hunting close to home and saves much in time and travel expenses; (k) The system is essentially a democratic and a non-profit one - no one who obeys regulations is excluded. Hunters consider that the small fees paid merely support the regulation and management upon which a continued crop depends. This mutually advantageous system prevents the development of exclusive non-democratic harvest plans."

There is a bibliography of 21 publications bearing on the subject matter, and attached to the leaflet is Release No. 17, Statistics on the game crop of Liberty Township, Wood County, Ohio, showing where the hunters came from and what they bagged; and Release No. 22, Map of Liberty Township Game Protective Association Lands.

Management: Farmer-sportsman relationship

Thompson, Willard C. A triangle of friends. The farmers; game birds of the fields and woods; the huntsmen, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(10), Oct. 1936, pp. 208-209, 223-224, 2 photos.

Decrease of game birds due to hunting and intensive agriculture should be compensated for by cooperative efforts in propagation, improvement of farm environment, increased care of wildlife in winter, better relationships between farmers and sportsmen, improving legal status of game, and increasing and diffusing knowledge of it.

Management: Flushing bar

Dalke, Paul D. Game bird flushing apparatus, Connecticut State Board of Fisheries and Game (Hartford, Conn.), Game Management Circular 2, 2 pp., 1 pl., no date, mimeographed.

Need for flushing bar; description and illustration; urges leaving uncut an outside swath of grain and hay fields.

Management: Forest game

Aldous, C. M. Game management on forest areas, Maine Forester (University of Maine, Orono, Me., 50 cents a copy), 1(2), May 1936, pp. 9-11.

On Harvard Forest, Mass., elimination of hardwoods modified the soil so that earthworms, and following them, woodcocks disappeared. Changing back to a mixed stand improved the soil so that both of these organisms were restored. The effect of forest management on wildlife is thus illustrated and it is an important consideration in a State so largely forested as Maine. Forest management and wildlife management can be carried on simultaneously over the same tracts, granted concessions on the part of both the forester and wildlife

manager. Planting should not be in large solid blocks, and where no planting is done the problem of the wildlife manager is to get cuttings distributed in small units and as uniformly as practicable. Timber stand improvement measures should be modified so as to favor wildlife. Fire lanes may be planted to white clover to the advantage of grouse, rabbits, and deer. Areas proportional to cruising radius should be provided with all the requirements of the species involved. A management program for wildlife should answer the questions: What do we have? Where is it? How much of it is there? Is any essential lacking? What can be done about it?

Management: Forest wildlife

McAtee, W. L. Forests and wildlife, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(9), Dec. 1936, pp. 6-8, 4 photos.

Probability that the primeval eastern forest contained openings, and value of such openings to wildlife. Tabulation of Pennsylvania forest (37.31 percent) and non-forest (62.69 percent) game according to the kill of 1935. Suggestions as to management of forest lands based on surveys in Centre County, Pa. Notes on trees, shrubs and other plants and their value to wildlife, and on food patches.

Management: General directions

Tripponsee, R. E. Means of increasing wild life, in A Handbook of Conservation with special reference to the landscape features in Essex County (Society for the Preservation of the Landscape Features of Essex County, Massachusetts, Salem, Mass.), 1936, pp. 34-39.

Management based on thorough knowledge of interrelations of the various forms of wildlife to each other and to their environment. Practical work and research should go hand in hand. Avoid drainage; create watering places; allow a sixth of each area to remain natural; plant fruit-bearers as bittersweet, Japanese barberry, Russian mulberry, flowering apple, native apple, flowering dogwood, red-osier, and mountain ash; plant food patches of buckwheat, proso, millet, hemp, flax, and sunflower; maintain winter feeding stations. Do all things necessary to preserve adequate breeding stock.

Management: History

Morton, James N. History of game management, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 8(1), April 1937, pp. 12-14, illus.

Reference to ancient modes of hunting, earliest known and later restrictions, modern developments including refuge and management systems.

Management: In Germany

Leopold, Aldo. Notes on game administration in Germany, American Wildlife (Investment Bldg., Washington, D. C., 25 cents a copy), 25(6), Nov.-Dec. 1936, pp. 85, 92-93, 6 photos.

Game administration is strictly centralized and is manned largely by volunteers without even adequate expense allotments. Game on public forests is administered by the forest service. Hunting goes with control of land and the net result is that it is restricted to foresters, officials, landowners, and people of means. The number of hunters in proportion to the population is smaller than in the United States but the kill per hunter is larger. An all day oral examination is held for applicants for hunting licenses. Regulation of the kill is accomplished by limiting the number of head shot on each hunting unit. Care of game is enjoined on the landowner by law, hence wardens become game management advisers. The system is well adapted to the maintenance of resident, but not of migratory, game. Notes are given on regulations, hunting customs, and on fish ponds. From observations of "vermin control" about these ponds, the conclusion is drawn that "too-artificial culture of one wildlife resource is usually in the last analysis bought at the expense of some other wildlife resource."

Management: Nest boxes for wood duck

Amadon, Dean. Nest boxes for wood ducks, Connecticut State Board of Fisheries and Game (Hartford, Conn.), Game Management Circular 4, 2 pp., 1 pl., no date, mimeographed.

Measurements, materials, location, and care of boxes. Illustration of box on tree with ramp.

Management: Planting

Dalke, Paul D. Suggestions for increasing the game in Connecticut by improving the environment, Connecticut State Board of Fisheries and Game (Hartford, Conn.), Game Management Circular 3, 6 pp., 1 pl., no date, mimeographed.

The supply of game can be increased when it is treated as a regular crop of the land. Hints regarding cover. Notes on food patches and what to plant in them. Value of fruiting shrubs, table showing their bearing seasons, instructions for propagating and planting them.

Management: Planting

McIntyre, Arthur C. Revegetating eroding hillsides, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(9), Dec. 1936, pp. 9, 16.

General statement of need of erosion control. Planting program, its potential value to wildlife; notes on plantings made in Pennsylvania in 1935

and requirements for 1936 and 1937, with special mention and statistics on species of particular importance for wildlife.

Management: Planting

Pearson, Allen M. Making soil conservation beneficial to wildlife, Georgia Sportsman (412 State Capital, Atlanta, Ga., 10 cents a copy), 1(3), pp. 3-4, 3 photos (1 of author).

"As goes the soil so goes the game." Many plants effective in controlling erosion are also suitable for wildlife development. Lespedezas, beggarweed, millets, sorghums, benne, cowpeas, and soy beans useful in open situations and privet, beautyberry, Russian olive, plum, and Scotch broom in gullies. Suggestions as to planting.

Management: Ponds

Davis, Cecil N. Wildlife saving farm ponds of Missouri, Soil Conservation (Supt. of Documents, Washington, D. C., 10 cents a copy), 2(7), Jan. 1937, pp. 153-155, 159, 6 photos.

Construction of ponds and planting both water and shore. Value to wildlife for water supply, food, and cover.

Management: Refuges

Goldman, Edward A. Bird refuges in the United States, The World Today (Encyclopaedia Brittanica, Inc., 342 Madison Ave., New York, N. Y.), 4(2), Dec. 1936, pp. 3-7, 4 photos.

Original wealth of wildlife including waterfowl; direct and indirect destruction by man; protection by treaty, by law, and by refuges. Acquisition of the Federal refuges outlined; and their number, location, and importance indicated. Briefer accounts of the Audubon refuges, National Park, National Forest and other classes of refuges.

Management: Refuges

Grinnell, Joseph, and Jean M. Linsdale. Vertebrate animals of Point Lobos Reserve, 1934-35, Carnegie Institution of Washington (Washington, D. C.), Publication No. 481, 159 pp., 39 pls., 1 fig., Dec. 1936.

A state park in Monterey County, Calif., its history, topography, meteorology, and ecology, with annotated lists of vertebrates and recommendations for administration.

Management: Refuges

Phillips, J. C., et al. Protected areas not locally administered, in A Handbook of Conservation with special reference to the landscape features in Essex County (Society for the Preservation of the Landscape Features of Essex County, Massachusetts, Salem, Mass.), 1936, pp. 71-78.

Description of 14 reservations in Essex County, Mass., with special notes on the wildlife of 5 of them by Ludlow Griscom.

Management: Refuges, Malheur Lake

Jewett, Stanley. Malheur Lake - greatest of wildfowl refuges, Outdoor America (1167 Merchandise Mart, Chicago, Ill., 10 cents a copy), N. S. 1(11), Sept. 1936, pp. 6-7, 3 photos.

History of the area which, including Malheur and Harney Lakes and the Blitzen River Valley, comprises 164,000 acres. Account of the breeding and migrant birds; the refuge harbors also numerous beavers, mule deer, and antelopes. Description of alterations made to conserve the water supply and facilitate administration.

Management: Seed storage, aquatic plants

Muenscher, W. C. Storage and germination of seeds of aquatic plants, Cornell Univ. Agr. Expt. Sta. Bul. (Cornell University Agricultural Experiment Station, Ithaca, N. Y.), 652, 17 pp., 3 tables, July 1936.

Author's summary: "Freshly harvested seeds of 43 species of aquatic plants growing wild in New York State were subjected to storage treatments as follows:

Series 1, stored in water at 1-3° C.
Series 2, stored in water at room temperature.
Series 3, stored dry at 1-3° C.
Series 4, stored dry at room temperature.

"The results of germination tests made on seeds of each series after about 2, 5, and 7 months in storage indicate that storage in water at a temperature just above freezing is the best of the treatments applied to insure viability and quick germination in most of the species tested.

"With few exceptions, seeds of most of the species would not germinate after 2 to 5 months of storage in water at room temperature. Seeds so treated entered a rest period but they could be induced to germinate by subsequently chilling them for 30 days. Seeds of Vallisneria, Orontium, and Nasturtium germinated well within 2 months after harvest, without chilling.

"The seeds of most species failed to germinate after 2 to 5 months in dry storage at 1-3° C. or at room temperature. In some species such as those of Orontium, Peltandra, Vallisneria, and Zizania drying the seed killed the embryo. In others drying prolonged the dormant state of the seed or, largely through changes in the seed coat or pericarp, caused it to enter a long rest period.

"The poor germinations of seeds of aquatic plants obtained by previous workers are believed to be due largely to the effects of drying and not to a normal dormant period of long duration. The storage conditions after which the best germination results were obtained approach nearest to the conditions to which seeds of aquatic plants are subjected when they are shed naturally, in water at low temperature from late autumn until early spring.

"The results of the germination tests here reported lead to the suggestion that seeds of most aquatic plants intended for planting should never be allowed to dry, but should be stored in water just above freezing temperature, until time for planting in the spring. Such treatment should provide a source of viable seed that can be shipped for some distance with the assurance that the seeds will germinate soon after they are planted in a suitable habitat."

Management: Stocking

Couch, Leo K. Trapping and transplanting live beavers, U. S. Dept. Agr. Farmers' Bul. (Supt. of Documents, Washington, D. C., 5 cents a copy), 1768, 18 pp., 15 figs., March 1937 (April).

Because of their value in water conservation, beavers that become destructive can well be moved to localities where they can do no harm. They can be trapped and moved at a cost of $10 or less each and have a market value alive much greater than that. Restocking operations in Wisconsin and Pennsylvania have restored beaver as trapable fur bearers and added materially to the income of rural sections. This bulletin discusses economics of the beaver, live trapping equipment and operations, holding pens, transportation, and stocking sites, operations, and costs.

Management: Stocking, Connecticut results

Anon. The liberation of pheasants in relation to reports of pheasants killed in Connecticut, Connecticut State Board of Fisheries and Game (Hartford, Conn.), Game Management Circular 5, 12 pp. plus 1 inserted chart and 1 sheet of tables, Dec. 1, 1936, mimeographed.

A careful analysis and comparison of figures for liberations from 1908 to 1936 and for the pheasant bag from 1923 to 1935, which are set forth also in a table and a graph. The main conclusions are: "1. The success of shooting seasons is dependent mostly on the results of natural propagation; 2. The liberation of pheasants contributes to the success of the subsequent shooting seasons only indirectly so far as it provides breeding stock; 3. The results of natural propagation are dependent upon weather conditions and upon other factors such as the supply of food and cover and the abundance of predators; 4. The liberation of pheasants beyond a certain point or number does not improve shooting in proportion either to the number liberated or to the expense. The records indicate that a liberation [in Connecticut] of about 12,000 birds in approximately equal sex ratio will give the maximum returns per dollar expended." (p. 8)

The report continues: "It may be that an annual liberation of about 12,000 birds, supplementing the population carried over from the previous year, together with the birds resulting from natural increase, constitutes a saturation point which is dependent on the availability of suitable food, cover, and range." (p. 9) The probability is pointed out that the saturation point has been reached, about 1 bird to 10 acres for parts of the State not in woods and not urbanized. Decrease in farming including practical abandonment of cereal

growing does not augur well for maintenance of the pheasant population.

A one-page report on results of distribution of pheasant eggs estimates that 2,800 pheasants were raised from 11,572 eggs. The ratio of birds reared and liberated to the number of eggs distributed has increased from 18 percent in 1933 to 24 percent in 1936.

Management: Suggestions for California

Storer, Tracy I. Game management on private lands in California, 8 pp., mimeographed, Nov. 1936. Obtainable from the author, University of California, Davis, Calif.

A paper read at the annual meeting of the Conservation Section, California State Chamber of Commerce. That State like most of the others having ravaged game and its environment and having tried the usual ineffective remedies finds it necessary to do something really constructive. Suggestions are given based on the fundamental environmental factors and their management for the benefit of wildlife. There is discussion also of public vs. private management, the benefits accruing from proper game management, and management measures capable of immediate application.

Management: Upland game birds, general policies

Anon. More upland game birds, More Game Birds in America (500 Fifth Ave., New York, N. Y.), 47 pp., illus. 1936?

A discussion of the decline in upland game birds and its causes, and what can be done about it, with suggestions for contributory legislation. The insistence upon the rights of landowners and upon the necessity of payment for sport is commendable. It is misleading, however, to point to conditions abroad where "excellent shooting is always available during long open seasons" for that expression does not apply anywhere to the thing American gunners have chiefly in mind, namely, public shooting. In view of recent findings, especially by Errington, the stressing of vermin control seems out-of-date. It is stated that predators have been little affected by the environmental changes inimical to game birds and that they have not been reduced to the same extent by man. On the contrary the fur producing predators have been very greatly reduced and predatory birds brought to the verge of extermination over great areas.

Management: Water supply development

Hogg, John E. Man-made oases save desert birds, Popular Science Monthly (353 Fourth Ave., New York, N. Y., 15 cents a copy), 129(4), Oct. 1936, p. 46, 3 photos.

Account of the development in the Southwest of seeps, springs, wells, etc., conservation of the water supply, and making it available to wildlife.

Management: Winter feeding

Anon. Winter feeding stations and foods for Michigan ground feeding birds, Michigan Conservation (State Dept. of Conservation, Lansing, Mich.), 6(6), Nov.-Dec. 1936, pp. 3-4, 6 photos.

Budding species like grouse rarely patronize feeding stations; for both granivorous birds and mammals, however, they may be life-savers in severe winter weather. Notes on natural foods, and upon locating, building, and servicing feeding stations.

Management: Winter feeding

Fox, Adrian C. Winter feeding of North Dakota birds, Soil Conservation Service (North Dakota Project No. 1, Park River, N. D.), 14 pp., 19 figs., mimeographed, 1936.

Sketches of numerous devices useful in winter feeding, with 3 pages of text devoted to deficiencies of cover and food, available natural foods and their value, feeding devices and shelters and their care; and one page of references to other publications.

Management: Winter feeding

Nagel, Werner O., and Rudolf Bennitt. Feeding stations and shelters for quail on Missouri farms, Mo. Agr. Extension Service Circ. (University of Missouri, Columbia), 356, 8 pp., 6 figs., Jan. 1937.

Drought and grasshoppers have greatly reduced quail food supplies and severe winters make feeding necessary if the birds are to survive on many farms. General directions are given as to the location and care of feeding stations and specific instructions with illustrations relating to tepee-type and lean-to shelters and feeders.

Natural History: Arizona

Authors. Arizona and its heritage, University of Arizona General Bul 3 (Univ. of Arizona, Tucson, $1.50 a copy), 291 pp., illus., April 1936.

Brief accounts are given of the more conspicuous forms of wildlife in chapters on Large Game Mammals and Large Predator Animals by A. A. Nichol, and on Important Rodents, Important Birds, and Important Reptiles by C. T. Vorhies.

Pollution

Trippensee, R. E. Pollution, in A Handbook of Conservation with special reference to the landscape features in Essex County (Society for the Preservation of the Landscape Features of Essex County, Massachusetts, Salem, Mass.), 1936, pp. 25-28.

Destructiveness of pollution; suggestions as to steps an individual can take to help remedy the trouble.

Predation: General discussion of

Errington, Paul L. Recent predator studies, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(12), March 1937, pp. 14, 30.

A summary of findings from 8 years of work with the principal game and fur species and nearly all kinds of predators in the Upper Mississippi Valley. In addition to field observations the results of about 15,000 analyses of food material underly the conclusions. The importance of carrying capacity of the environment is emphasized as is the inability of predators to remove anything but the excess population. Populations above carrying capacity are vulnerable and the relative availability of such populations determines what predators feed upon. Ordinary vermin control operations are "useless or worse".

"From the standpoint of economics or of wildlife management, some reduction in the numbers of certain predators may now and then be desirable, but it is hard to see virtue in the blind and excessive practices too often indulged in. Animal populations being to a large extent self-limiting within the bounds imposed by environment and hereditary make-up, much of the predation upon them doesn't really seem to count anyway, conspicuous though it may be.

"By all odds, what amounted to the most effective predator control I've ever seen was accomplished on a wildlife refuge where hawks and owls were protected along with the other native residents, but where the food and cover relationships were handled intelligently."

Propagation: Brooding in dark to control vices

Bedell, C. S. Pheasants in the dark, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(10), Oct. 1936, pp. 206, 220, 2 photos.

Rearing in the dark adopted to stop toe picking and other cannibalistic practices. The birds are kept indoors until 12 weeks of age and are given no green food or eggs. Description of brooders and their management during the period is given. The method is considered as a long step toward economical mass production.

Propagation: Chukar partridge

Sibley, C. L. The feeding and care of chukars, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(10), Oct. 1936, p. 212.

Chiefly feeding directions; rearing on wire is recommended; one hen laid 69 eggs.

Propagation: Hungarian partridge

Wessell, Charles W. Raising the Hungarian partridge, Pennsylvania Game News (Board of Game Commissioners, Harrisburg, Pa., 10 cents a copy), 7(12), March 1937, pp. 4-5, 4 photos.

Hand-reared stock decidedly preferable; notes on distinguishing the sexes, and on care of breeders. Habits in the field; comparison with bobwhite.

Propagation: Irradiation results

Clark, Leonard B., Samuel L. Leonard, and Gardiner Bump. Light and the sexual cycle of game birds, Science (Lancaster, Pa., 15 cents a copy), 85(2205), April 2, 1937, pp. 339-340.

Conclusions from experiments are: "The absence of light inhibits the onset of sexual activity in the grouse and pheasant. x x x Continuous illumination during the winter months can stimulate grouse into sexual activity and egg-laying but does not prevent the cessation of egg-laying. x x x [This] is probably due to a failure of the hypophysis to furnish the necessary gonad-stimulating hormones rather than to an exhaustion of the gonads. x x x The gonads of immature pheasants will respond to adequate hypophyseal stimulation."

Summary: "The results of these experiments has led us to conclude that light is a primary factor in inducing sexual activity in pheasants, quail and grouse, through the mediation of the hypophysis. Once this hypophyseal-gonad reaction is started it can not continue indefinitely with adequate light but only until the hypophysis falters in the production of the gonad-stimulating hormone through causes unknown. The immature pheasant resembles the adult at the close of the breeding season in that the gonads are capable of responding to adequate hypophyseal stimulation."

Propagation: Pheasants

Simpson, 'Gene M. Directions for raising game pheasants, Modern Game Breeding and Hunting Club News (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa., 25 cents a copy), 7(1), Jan. 1937, pp. 6-7, 14, illus.

Directions for small scale breeding, covering rearing pens, brood coops, and runways, preparation of nests, setting hens, care of young, and feeding.

Propagation: Protein requirements of pheasant

Norris, L. C., L. J. Elmore, R. C. Ringrose, and Gardiner Bump. The protein requirements of ring-necked pheasants, Poultry Science (Cornell University, Ithaca, N. Y., 75 cents a copy), 15(6), Nov. 1936, pp. 454-459, 5 tables.

Growth increased with rise in the protein content of the diet as far as tested (33 percent). Biometrical analysis of the results indicates that 30 percent of protein is necessary during the first eight weeks of life in order

to promote a maximum rate of growth; in ordinary practice a 24 percent level will be satisfactory. Bibliography of 7 titles.

Propagation: Wild turkey

Steinhart, C. V. The propagation of wild-trapped turkeys, Game Breeder and Sportsman (205 E. 42nd St., New York, N. Y., 25 cents a copy), 40(12), Dec. 1936, pp. 247, 258, 2 photos.

General account of system used on a 'southern plantation': taming, nesting, brooding, hardening, shipment.

Research: Necessary basis for management

Leopold, Aldo, Chairman. Wildlife crops, finding out how to grow them, American Wildlife Institute (Investment Bldg., Washington, D. C.), 23 pp., illus., 1936.

A research and demonstration program prepared by the Technical Committee of the American Wildlife Institute. Committee members, besides the Chairman, are Gardiner Bump, George C. Embody, Carl L. Hubbs, and Herbert L. Stoddard; photographs of these men form the frontispiece. The report is organized about the why, how, and what of research and projects are suggested for farm, forest, range, and migratory game, fur animals, non-shootable game, and rare or threatened non-game species. Research can furnish the facts for management, and management can furnish abundant wildlife wherever it can control the condition of the range or environment.

ADDENDUM

Conservation

Haskell, Wm. S. The American Game Protective and Propagation Association. A history. Published by the Association (19 Rector St., New York, N. Y.), 67 pp., 2 pls., Feb. 1937.

History of the Association which was organized in 1911 and largely transformed into the American Wildlife Institute in 1935, and of the major conservation movements which it sponsored. The American Sportsmon's Platform and The American Game Policy are reprinted. The two plates reproduce photographs of John B. Burnham, Carlos Avery, Seth Gordon, and William B. Greeley.

WILDLIFE RESEARCH AND MANAGEMENT LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Biological Survey, U. S. Department of Agriculture, Washington, D. C.

BS-72. Check-list of marsh and aquatic plants of the United States, by Neil Hotchkiss, December 1936, 27 pp.

Contribution toward a standardized list of both the scientific and vernacular names of these plants.

BS-77. The wild turkey on the Missouri Ozark Range, by Harold L. Blakey, January 1937, 32 pp., 2 pls., 1 table.

Characteristics of the native turkey and of restocking birds; life history including mating, nesting, food habits, with table of food items; checks to increase; management; and conservation. Bibliography of 6 titles.

BS-78. Directions for destroying house mice, January 1937, 2 pp.

Trapping, poisoning; cats as mousers; repelling mice.

BS-80. Feeding and caring for squirrels, January 1937, 2 pp.

Food; cages and nests; care and sanitation.

BS-81. Suggestions for combating starling roosts, by E. R. Kalmbach, February 1937, 17 pp., 1 plate.

Introduction, present range, and economic status of starlings; objectionable roosts and methods of controlling them; reducing numbers of starlings; bibliography of 5 titles.

BS-84. Food of the scaled quail, by Leon H. Kelso, March 1937, 9 pp., 2 tables.

Description of bird and statement of its range and habitat. Report on study of stomachs and crops of 258 adult and 9 immature scaled quail. Vegetable matter taken by adults 78.12 percent, main items, grains and greens; the plants Sophia menziesii and Gutierrezia texana patronized more than others; animal food 21.88 percent, largest single item, grasshoppers. The percentages of vegetable and animal food for the 9 young studied are almost the reverse of those for the adults, namely, 28.82:71.17. A table compares the findings with those for three other species of quail. There is a summary and a bibliography of 12 titles.

BIOLOGICAL BIBLIOGRAPHIES

Biological journals

Of general scope

The American Journal of Anatomy. Bi-monthly, $7.50 a year. Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia, Pa.

American Journal of Science. Monthly, $6.00 a year, single copy 60 cents. New Haven, Conn.

American Naturalist. Bi-monthly, $5.00 a year, single copy $1.00. Science Press, Grand Central Terminal, New York, N. Y.

The Anatomical Record. Monthly, $5.00 a year. Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia, Pa.

Aquatic Life. Monthly, $1.50 a year. August M. Roth, 614 N. Chester St., Baltimore, Md.

Biological Abstracts. Monthly, $9.00 a year. University of Pennsylvania, Philadelphia, Pa.

The Biological Bulletin. Issued six times a year, $4.50 a year, single copy $1.75. Prince and Lemon Sts., Lancaster, Pa.

Canadian Journal of Research. Monthly, Sections C and D, Botanical and Zoological Sciences, $2.50 a year, single copy 25 cents. National Research Council, Ottawa, Canada.

Genetics. A Periodical Record of Investigations bearing on Heredity and Variation. Bi-monthly, $6.00 a year, single copy $1.25. Genetics, Menasha, Wis.

Guide to Nature. Quarterly, $1.00 a year, single copy 25 cents. Agassiz Association, Inc., Old Greenwich, Conn.

Journal of Agricultural Research. Semi-monthly, $2.25 a year. Supt. of Documents, Washington, D. C.

Journal of Bacteriology. Monthly, $10.00 a year. Williams & Wilkins Co., Baltimore, Md.

The Journal of Experimental Zoology. Issued eight times a year, $7.50 a year. Wistar Institute of Anatomy and Biology, 36th St., and Woodland Ave., Philadelphia, Pa.

Journal of General Physiology. Bi-monthly, $5.00 a year, single copy $1.00. Rockefeller Institute for Medical Research, York Ave. and 66th St., New York, N. Y.

The Journal of Heredity. Monthly, $3.50 a year, single copy 35 cents. American Genetic Assoc., Victor Bldg., Washington, D. C.

Journal of Morphology. Quarterly, $12.00 a year. Wistar Institute of Anatomy and Biology, 36th St. and Woodland Ave., Philadelphia, Pa.

The Journal of Parasitology. Bi-monthly, $4.00 a year. Lancaster, Pa.

Natural History. Journal of the American Museum of Natural History. Monthly (except July and August), $3.00 a year, single copy 50 cents. New York, N.Y.

Nature Magazine. Monthly, $3.00 a year. 1214 - 16th St., N.W., Washington, D. C.

Nature Notes. Monthly, $1.00 a year, single copy 10 cents. 4800 Prospect Road, Peoria, Ill.

Northwest Science. Issued five times a year, $1.00 a year, single copy 35 cents. The Northwest Scientific Association, Cheney, Wash.

Philosophy of Science. Quarterly, $5.00 a year. Williams and Wilkins Co., Baltimore, Md.

Physiological Reviews. Quarterly, $6.00 a year, single copy $2.50. D. R. Hooker, 19 W. Chase St., Baltimore, Md.

Popular Science Monthly. Monthly, $1.50 a year, single copy 15 cents. Popular Science Publishing Co., Inc., 353 Fourth Ave., New York, N. Y.

The Quarterly Review of Biology. Quarterly, $5.00 a year, single copy $1.50. Williams and Wilkins Co., Baltimore, Md.

Science. Weekly, $6.00 a year, single copy 15 cents. The Science Press, Lancaster, Pa.

Science News Letter. Weekly, $5.00 a year, single copy 15 cents. Science Service, 2101 Constitution Ave., Washington, D. C.

Scientific American. Monthly, $4.00 a year, single copy 35 cents. 24 West 40th St., New York, N. Y.

Scientific Monthly. Monthly, $5.00 a year, single copy 50 cents. The Science Press, Lancaster, Pa.

Of local scope

The American Midland Naturalist. Bi-monthly, volumes and single copies variously priced. University of Notre Dame, Notre Dame, Ind.

Florida Naturalist. Quarterly, $1.00 a year. Florida Audubon Society, Daytona Beach, Fla.

Ohio Biological Survey Bulletin. Issued irregularly, volumes of about 500 pages each, $3.00, single copies variously priced. Ohio State University Press, Columbus, Ohio.

The Ohio Journal of Science. Bi-monthly, $2.00 a year, single copy 50 cents. Ohio State University, Columbus, Ohio.

Botanical journals

American Botanist. Quarterly, $2.00 a year, single copy 50 cents. Willard N. Clute & Co., Butler University, Indianapolis, Ind.

American Fern Journal. Quarterly, $1.25 a year. Brooklyn Botanic Garden, Brooklyn, N. Y.

American Forests. Monthly, $4.00 a year. American Forestry Association, 1713 K St., N. W., Washington, D. C.

American Journal of Botany. Issued ten times a year, $8.00 a year, single copy $1.00. Boyce-Thompson Institute for Plant Research, Yonkers, N. Y.

Botanical Gazette. Quarterly, $8.00 a year. University of Chicago, Chicago, Ill.

The Botanical Review. Monthly, $3.00 a year. Lime & Green Sts., Lancaster, Pa.

Bulletin of the Torrey Botanical Club. Issued nine times a year, $6.00 a year. Columbia University, New York, N. Y.

Claytonia. Quarterly, $1.50 a year. 213 Maiden Lane, Lexington, Va.

Desert Plant Life. Monthly, $1.50 a year, single copy 25 cents. Desert Magazine Publishing Co., 216 South Brand Boulevard, Glendale, Calif.

Journal of the Arnold Arboretum. Quarterly, $4.00 a year, single copy $1.25. Jamaica Plain, Mass.

Journal of Forestry. Monthly, $4.00 a year. Society of American Foresters, Mills Bldg., Washington, D. C.

Journal of the Southern Appalachian Botanical Club. Monthly, $2.00 a year. West Virginia University, Morgantown, W. Va.

Leaflets of Western Botany. Issued about four times a year, $1.00 a volume, single copy 40 cents. Academy of Sciences, San Francisco, Calif.

Madrono, A West American Journal of Botany. Quarterly, $2.50 a year, single copy 75 cents. Carnegie Institution of Washington, Stanford University, Calif.

Plant Physiology. Quarterly, $8.00 a year, single copy $2.50. Lime & Green Sts., Lancaster, Pa.

Phytologica. Designed to expedite botanical publication. Issued irregularly, $5.00 per volume in advance. New York Botanical Garden, Bronx Park, New York, N. Y.

Rhodora. Monthly, $2.00 a year. 300 Massachusetts Ave., Cambridge, Mass.

Torreya. Bi-monthly, $1.00 a year. Columbia University, New York, N. Y.

Museum and society publications, excluding those of Academies of Science

Bulletin: California Institute of Technology. Quarterly, no price quoted. Pasadena, Calif.

Bulletin of the Boston Society of Natural History. Quarterly, no price quoted. Boston, Mass.

Bulletin of the Ecological Society of America. Quarterly, $1.00 a year. Natural History Bldg., Urbana, Ill.

Bulletin of the Museum of Comparative Zoology. Issued irregularly, parts variously priced. Cambridge, Mass.

Bulletin: New York Zoological Society. Bi-monthly, $1.50 a year, single copy 30 cents. New York, N. Y.

Bulletin of the Zoological Society of Philadelphia. Bi-monthly, no price quoted. Philadelphia, Pa.

Ecological Monographs. Quarterly, $6.00 a year, single copy $1.50. Duke University Press, Durham, N. C.

Ecology. Quarterly, $4.00 a year, single copy $1.25. Prince and Lemon Sts., Lancaster, Pa.

Journal of the Elisha Mitchell Scientific Society. Semi-annual, $3.00 a year, single copy $1.50. University of North Carolina Press, Chapel Hill, N. C.

New York State Museum Bulletin. Monthly, no price quoted. The University of the State of New York, Albany, N. Y.

New York State Museum Handbook. Issued irregularly, no price quoted. The University of the State of New York, Albany, N. Y.

Occasional Papers of the Museum of Zoology, University of Michigan. Issued irregularly, no price quoted. University of Michigan Press, Ann Arbor, Mich.

Proceedings of the Colorado Museum of Natural History. Issued irregularly, no price quoted. Denver, Colo.

Proceedings of the New England Zoological Club. Issued irregularly, no price quoted. Museum of Comparative Zoology, Cambridge, Mass.

Transactions of the San Diego Society of Natural History. Issued irregularly, no price quoted. San Diego, Calif.

Zoologica. Scientific Contributions of the New York Zoological Society. Quarterly, prices fixed by the cost of printing. New York, N. Y.

Zoological Series of the Field Museum of Natural History. Issued irregularly, no price quoted. Chicago, Ill.

Zoopathologica: Scientific Contributions of the New York Zoological Society on the Diseases of Animals. Issued irregularly, no price quoted. New York, N. Y.

NOTES AND NEWS

Information concerning the four major North American waterfowl flyways and the biologists assigned to them. As outlined in Department Circular No. 342, "The Waterfowl Flyways of North America", there are four major flyways on the North American continent which may be designated as the Atlantic, Mississippi, Central, and Pacific. Obviously, the boundaries of these lanes do not follow political lines nor are they sharply defined in the interior of the country. In other words, there is more or less overlapping and in the North this may result in identical territory for two or more flyways. However, for administrative reasons it is necessary that the territory assigned to the different biologists follow political boundaries. The biologist assigned to each flyway is authorized to perform official travel in the states designated as in his flyway.

Atlantic Flyway.- The territory included in this region is the West Indies, Florida, Alabama, Georgia, South Carolina, North Carolina, Tennessee, Kentucky, Virginia, West Virginia, Maryland, Ohio, Pennsylvania, New Jersey, Delaware, New York, all of New England, Ontario, Quebec, New Brunswick, Nova Scotia, Prince Edward Island, Newfounland (including Labrador), the eastern islands of Franklin and Greenland.

Effective February 1, 1937, Harold S. Peters was transferred from the cooperative wildlife research unit at Alabama Polytechnic Institute, Auburn, Ala., in the section of Wildlife Surveys, to become the flyway biologist of the Atlantic flyway. His temporary headquarters are at Auburn but he will later be transferred to Washington, D. C., where he will do research and bird migration work on the Atlantic Flyway.

Mississippi Flyway.- The territory included in this flyway is Mexico and other Central American countries, Texas, Louisiana, Mississippi, Arkansas, Tennessee, Kentucky, Missouri, Illinois, Indiana, Ohio, Michigan, Iowa, Nebraska, Wisconsin, Minnesota, South Dakota, North Dakota, Montana, Ontario, Manitoba, Saskatchewan, Alberta, Mackenzie, Yukon, and Alaska.

Charles E. Gillham, formerly of the Division of Game Management, was transferred to the Research Division early in 1936 and assigned to duty as the flyway biologist of this flyway. His headquarters are at Iowa State College, Ames, Iowa.

Central Flyway.- The region of this flyway includes Mexico and other Central American countries, Texas, Louisiana, Arkansas, Missouri, Oklahoma, New Mexico, Arizona, Utah, Colorado, Kansas, Nebraska, Wyoming, South Dakota, North Dakota, Montana, Manitoba, Saskatchewan, Alberta, Mackenzie, Yukon, and Alaska.

Effective March 1, 1937, Dr. Geo. B. Saunders, formerly of the Migratory Waterfowl Division, was transferred to the position of flyway biologist for the Central Flyway. His headquarters are in the Customs House, Denver, Colo.

Pacific Flyway.- This flyway includes Mexico and other Central American countries, Arizona, California, Utah, Nevada, Idaho, Montana, Oregon, Washington, Saskatchewan, Alberta, British Columbia, Mackenzie, Yukon, and Alaska.

When the Section of Distribution and Migration of Birds was first created in 1934, the only field representative then on the staff was Luther J. Goldman, who for a year or two had to cover many areas on annual waterfowl surveys. His activities are now limited to the Pacific Flyway and his headquarters are at 1092 Keith Ave., Berkeley, Calif.

Dr. Allen M. Pearson of the Soil Conservation Service with headquarters at Rome, Georgia, has been transferred to the Biological Survey to take the position vacated by Mr. Peters (see previous note) and will be stationed at Auburn, Ala.

The Ohio Cooperative Wildlife Research Station has issued some 20 mimeographed statements relating to its work. Three of these are abstracted in preceding pages (21 to 22) and three others may be briefly noted here. Release No. 19 gives general information relating to the Station, including definition, objectives, directorial staff, location (including field stations), and problems under investigation. Release No. 21 describes Wildlife Conservation Schools conducted in cooperation with the Ohio Division of Conservation. There were week long classes organized in three divisions of the State and attended by an average of 58 students. The methods of conducting the schools are comprehensively outlined. Release No. 24, entitled A Wildlife Management Primer for Ohio, is devoted to an exhibit at the Toledo Sportsmen's Exposition of February 1937. The legends for the exhibits are quoted.

There are now about 21 universities and colleges that have schools of conservation. 9 of these also have wildlife research units in cooperation with the Biological Survey. There are about 45 college staff members and 33 graduate students cooperating with the Biological Survey on projects in wildlife management.

The Migratory Bird Treaty with Mexico was formally ratified March 15, 1937. The terms of the treaty enable the United States to give Federal protection to some 140 species of birds not covered by the Canadian Treaty of 1916.

The Forest Service announces that special efforts are being made to protect the remaining few California Condors, headquarters for which are in the Los Padres National Forest.

Humane traps, that catch and hold animals with a loop of flexible chain and cannot mangle their catch, have been ordered to replace steel jaw traps on all Indian lands. A holiday for wildlife has also been declared. Only wild animals harmful to crops and domestic animals may hereafter be exterminated on lands under the Office of Indian Affairs.

(Science News Letter, Vol. 31, No. 832, March 20, 1937, p. 184.)

The Massachusetts Department of Conservation (Boston) has issued (Feb. 1937) in mimeographed form a "policy" and a "general plan" for the development of State Forests in relation to wildlife.

The magazine "Conservation" has assumed new octavo form, and is to be a bi-monthly digest of current articles on the conservation of natural resources. It is published by The American Forestry Association, 919 - 17th St., Washington, D. C., at $1.00 a year; 20 cents a copy.

A publication in octavo leaflet form called The Eskimo is devoted to the interest of Alaskan natives, particularly Eskimos and to their reindeer industry. It is issued quarterly at 3627 Ashworth Avenue, Seattle, Washington.

National Nature News is a new publication intended primarily for the presentation of material that can be used for teaching natural history. It is to be issued monthly at $2.00 per year and can be addressed at 3107 Wisconsin Ave., Washington, D. C.

The Wildlife Society.- Following a year of existence under the name Society of Wildlife Specialists, formal organization of The Wildlife Society was accomplished at St. Louis, Mo., February 27-March 2, 1937. The Society is primarily a professional group in which Active Members shall be those engaged in the practice or teaching of wildlife research, management, or administration, or who are graduate students of those subjects. Associate Members shall be those interested in the objects of the Society who are sponsored by two Active Members. Some of the principal objectives of The Wildlife Society are the development of all types of wildlife management along sound biological lines, the establishment of professional solidarity among conservation biologists, and the maintenance of the highest possible professional standards.

An official organ, The Journal of Wildlife Management, to contribute to these ends, will be launched in 1937, probably as a quarterly, under the editorship of W. L. McAtee, U. S. Biological Survey, Washington, D. C.

The governing body of the Society for the year 1937 consisting of the officers and six regionally representative councillors, includes:

President, Rudolf Bennitt, Associate Professor of Zoology, University of Missouri, Columbia, Mo.

Vice-President, Joseph S. Dixon, Field Naturalist, National Park Service, San Francisco, Calif.

Secretary, Victor H. Cahalane, Assistant Chief, Wildlife Division, National Park Service, Washington, D. C.

Treasurer, Warren W. Chase, Regional Biologist, Soil Conservation Service, Des Moines, Iowa.

Councillors:

For Region 1 (Northeast), Arthur A. Allen, Professor of Ornithology, Cornell University, Ithaca, N. Y.

For Region 2 (Southeast), William J. Howard, Regional Wildlife Technician, National Park Service, Richmond, Va.

For Region 3 (North Central), Samuel A. Graham, Professor of Economic Zoology, University of Michigan, Ann Arbor, Mich.

For Region 4 (Northern Great Plains), Verne E. Davison, Regional Biologist, Soil Conservation Service, Rapid City, S. Dak.

For Region 5 (Southwest), Walter P. Taylor, Senior Biologist, Bureau of Biological Survey, Texas A. & M. College, College Station, Texas.

For Region 6 (West), E. Lowell Sumner, Jr., Regional Wildlife Technician, National Park Service, San Francisco, Calif.

The following Advisory Committee also has been named by the President:

Aldo Leopold, University of Wisconsin, Madison, Wis.
Herbert L. Stoddard, Thomasville, Ga.
Joseph Grinnell, University of California, Berkeley, Calif.
Ralph T. King, University of Minnesota, St. Paul, Minn. (past President)

Correspondence should be addressed to the Secretary.

Dr. Percy R. Lowe of the British Museum, retired, is Chairman of the British Section of an international committee that is investigating the status of wild fowl in Europe. Dr. Lowe in a statement made several years ago said unless there is international action for their protection that the wild fowl and waders of Europe are doomed, and it is evident from the present cooperative effort that representatives of other nations agree with him. This

situation should help to correct the idea that seems to be prevalent among American sportsmen that game of all kinds is much more abundant in Europe than in this country.

Some American wildlife managers may be interested in Journal of the Society for the Preservation of the Fauna of the Empire [British] which discusses rare species and the methods that are being taken or should be taken to preserve them. The January 1937 issue (96 pp.) contains contributions relating to Ceylon, Malaya, British North Borneo, British West Indies, North Africa, Tanganyika Territory, and Zululand. There is also an article of general application on "Mammals which have recently become extinct and those on the verge of extinction". The publication contains brief sketches relating to restocking of the Crow Indian Reservation in Montana and Wyoming, and to the effects of drought on wildlife in the United States. It may be obtained from Stephen Austin & Sons, Ltd., 1 Fore St., Hertford, England, for 2 shillings, 6 pence a copy.

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